Department of Education
GOVERNMENT OF WESTERN AUSTRALIA

Selective Entrance Test:
Sample Test

QUANTITATIVE REASONING
YEAR 6

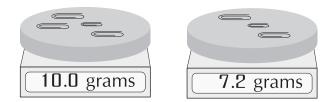**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD**

INSTRUCTIONS

- All answers must go in your answer booklet.
- This test asks you to answer 35 questions on mathematical material.
- For each question you are given four possible answers marked **A, B, C and D**. You must choose the answer you think correct and mark its letter (**A, B, C or D**) in your answer booklet in the section labelled Quantitative Reasoning.
- Mark your answers carefully - be sure that the question number on your answer booklet corresponds to the number of the question you are answering.
- Do not spend too much time on any one question; you may come back to the difficult ones later if you have time.
- Use a lead (graphite) pencil.
- If you think you know an answer, mark it even if you are not certain it is correct. *Marks will not be deducted for incorrect answers, only awarded for correct ones.*
- If you decide to change an answer, erase it completely and mark your new answer.
- You will have 35 minutes to do this test. Once you start this test, keep working until you have finished or the supervisor tells you to stop.
- You are allowed to write on this test booklet to help you work through the questions, but you must put your answers in your answer booklet.
- **Do not turn the page**. Wait for the supervisor to give you the signal to start.

  WRITE YOUR FULL NAME TO ACKNOWLEDGE YOU HAVE READ THESE INSTRUCTIONS HERE:

  _____

ACER

PAPER CLIPS

Jens has large paper clips and small paper clips. He is weighing them using kitchen scales.

Three large paper clips and one small paper clip weigh 10 grams.

Jens removes one of the large paper clips; the remaining paper clips weigh 7.2 grams.
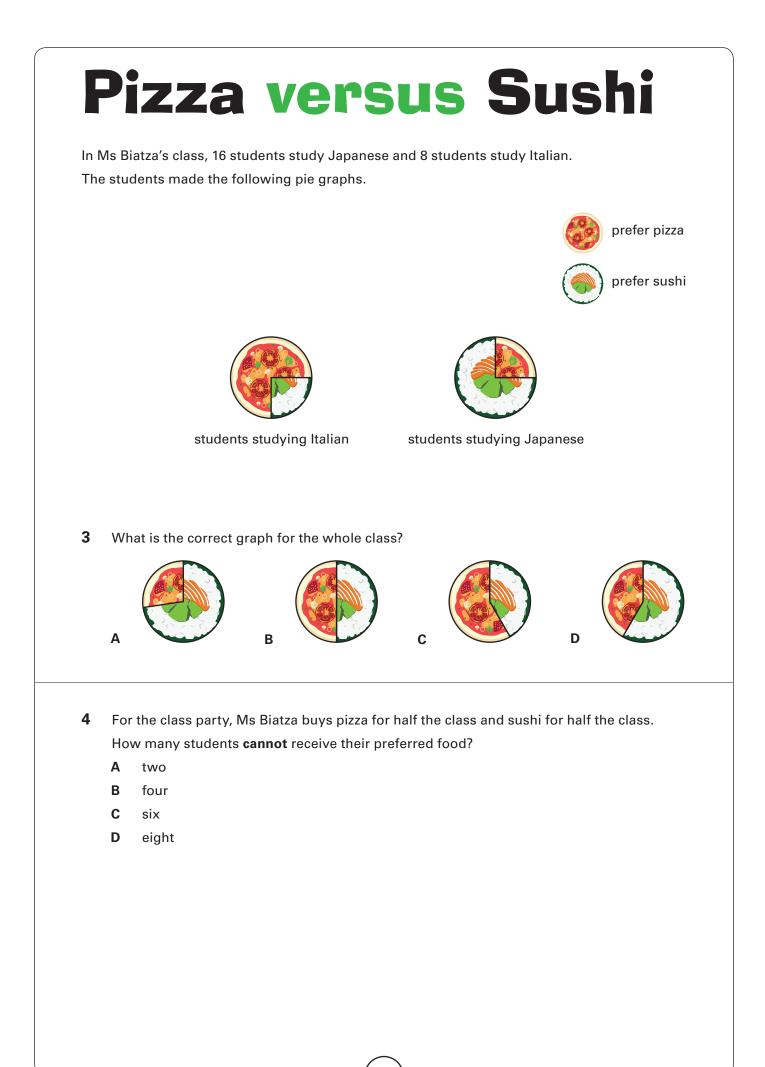
1   How much does one small paper clip weigh?

    A   1.4 grams   **C**   2.4 grams

    B   1.6 grams   **D**   2.5 grams
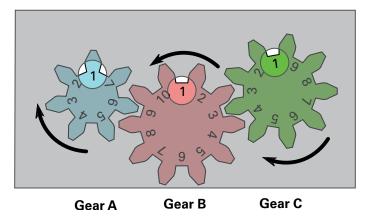
LUCKY PACKS

Cards for a trading card game can usually be purchased in packs of 10. The packs cost $6 each.

As part of a special offer, the packs contain two extra cards for no extra cost!

2   What is the difference in the price **per card** between packs of 10 and packs of 12?

    A   10 cents

    B   20 cents

    C   50 cents

    D   60 cents

Pizza versus Sushi

In Ms Biatza's class, 16 students study Japanese and 8 students study Italian.

The students made the following pie graphs.

prefer pizza

prefer sushi

students studying Italian

students studying Japanese

3   What is the correct graph for the whole class?

A   B   C   D

4   For the class party, Ms Biatza buys pizza for half the class and sushi for half the class.

How many students **cannot** receive their preferred food?

A   two

B   four

C   six

D   eight

Get into gear

Three gears are shown below. When any one gear is turned, the other two also turn. The gears only turn in the directions shown by the arrows.

Gear A   **Gear B**   **Gear C**

Each gear has numbers printed on it. As the gears turn, a different number appears inside the circular window in front of each gear.

In the starting position, each gear has '1' in its window.

When gear A makes one full turn, so that '1' is in its window again, gears B and C each show '8' in their windows.
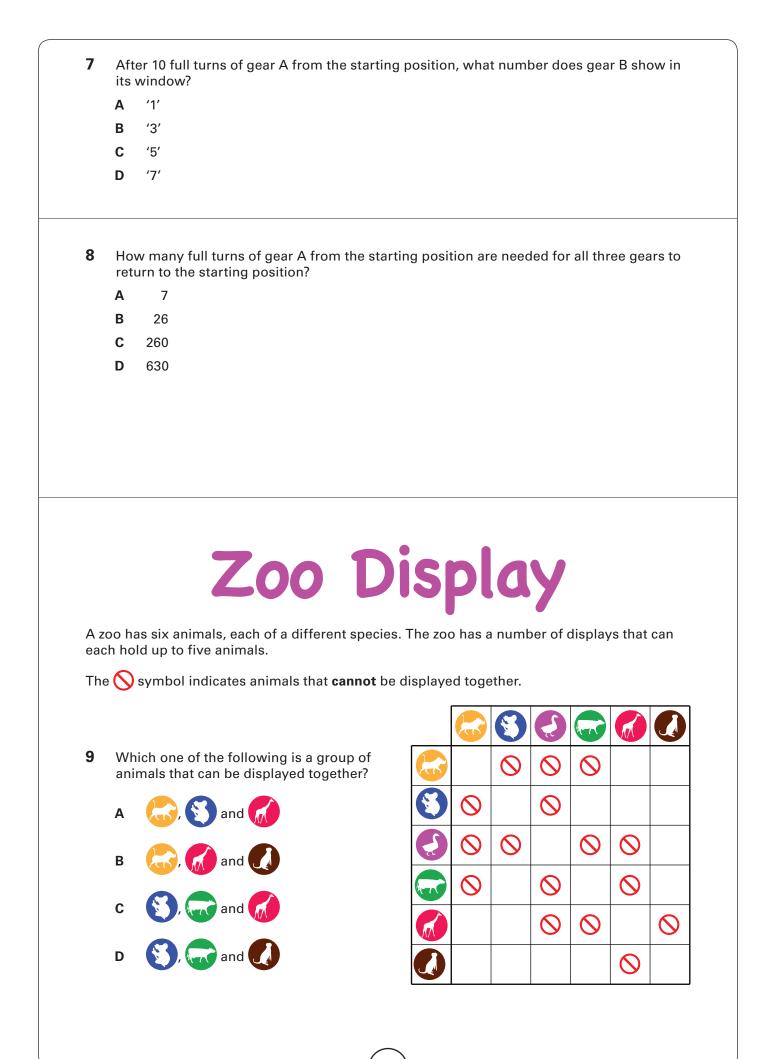
5   From the starting position, gear A makes three full turns.

What numbers do gears B and C now show in their windows?

A   '2' and '3'

B   '2' and '4'

C   '3' and '4'

D   '3' and '6'

6   From the starting position, gear A is turned so that gear C completes one full turn.

What number does gear A now show in its window?

A   '2'

B   '3'

C   '6'

D   '7'

7 After 10 full turns of gear A from the starting position, what number does gear B show in its window?

A '1'

B '3'

C '5'

D '7'

8 How many full turns of gear A from the starting position are needed for all three gears to return to the starting position?

A 7

B 26

C 260

D 630

Zoo Display

A zoo has six animals, each of a different species. The zoo has a number of displays that can each hold up to five animals.

The 🚫 symbol indicates animals that **cannot** be displayed together.

9 Which one of the following is a group of animals that can be displayed together?

A 🐱, 🐨 and 🦒

B 🐱, 🦒 and 🐒

C 🐨, 🐃 and 🦒

D 🐨, 🐃 and 🐒

	🐱	🐨	🦢	🐃	🦒	🐒
🐱			🚫	🚫	🚫	
🐨	🚫			🚫		
🦢	🚫	🚫			🚫	🚫	
🐃	🚫			🚫		🚫	
🦒			🚫	🚫		🚫
🐒					🚫	

#unknown

In the equations below, # always represents the same mathematical sequence. The sequence is made up of one of the basic operators (+, –, × and ÷), followed by a positive whole number, followed by another one of the basic operators.

For example:

3 # 2 = 4

and

4 # 1 = 7

10 What is 3 # (2 # 1)?

    A   0

    B   3

    C   6

    D   7

11 (4 # 1) # (5 # ☐) = 9
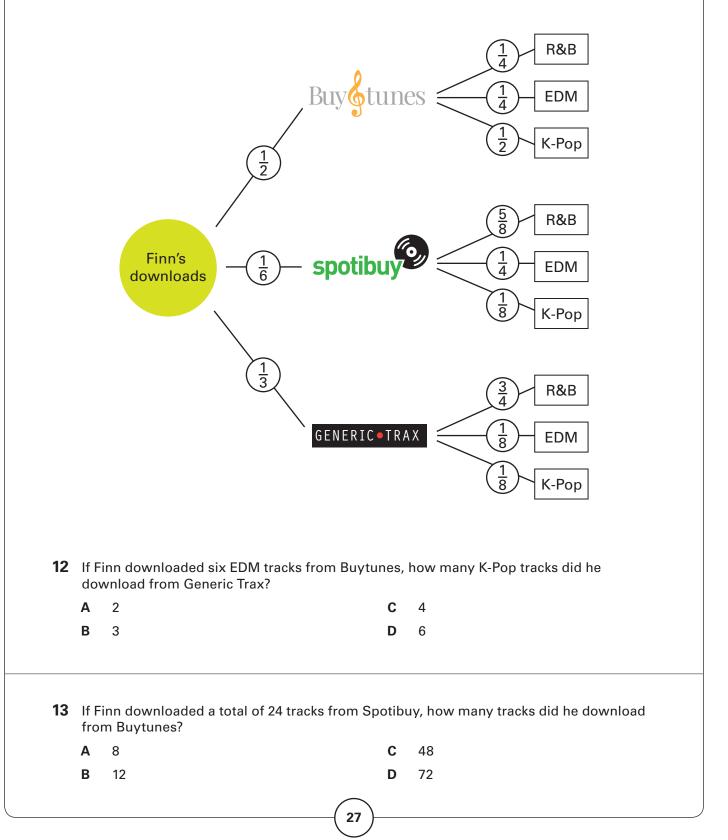
    ☐ is a positive whole number.

    What is ☐?

    A   1

    B   2

    C   5

    D   10

ONLINE MUSIC

Finn has downloaded three types of music tracks (R&B, EDM and K-Pop) from three online stores (Buytunes, Spotibuy and Generic Trax).

The figure indicates the distribution of his downloads. For example, half of his tracks came from Buytunes, and one-quarter of these were R&B.
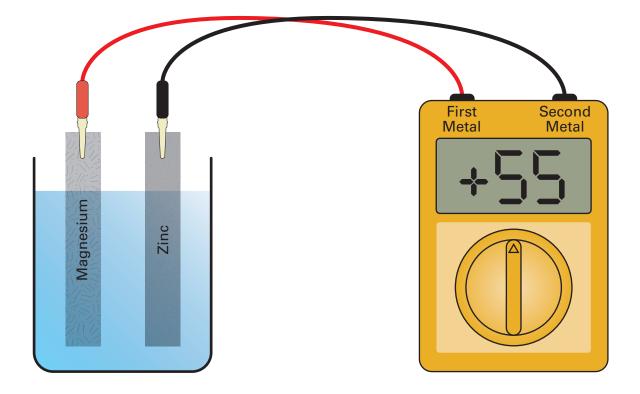

12 If Finn downloaded six EDM tracks from Buytunes, how many K-Pop tracks did he download from Generic Trax?

A	2	**C**	4
B	3	**D**	6

13 If Finn downloaded a total of 24 tracks from Spotibuy, how many tracks did he download from Buytunes?

A	8	**C**	48
B	12	**D**	72

Testing Metals

Metals can be ranked on a scale of reactivity. Jiao uses a special meter that compares one metal to another. The meter measures the **differences** in reactivity between the two metals.

Jiao compared several different metals. The results are shown in the table.

For example, magnesium is 55 units **more** reactive than zinc, and aluminium is 31 units **less** reactive than zinc.

If the *first metal* and *second metal* are swapped, the difference is reversed, as shown for magnesium and aluminium in the table.

First metal	Second metal	Difference
magnesium	aluminium	+86
aluminium	magnesium	−86
copper	gold	+44
lead	copper	+27
lead	magnesium	−111
gold	lead	−71
aluminium	zinc	−31
magnesium	zinc	+55

14 Which of the following metals has the lowest reactivity?

    A   gold

    B   lead

    C   magnesium

    D   aluminium

15 Which one of the following metals has a reactivity between the reactivities of aluminium and copper?

    A   gold

    B   lead

    C   zinc

    D   magnesium

16 What would the meter read if the first metal is gold and the second metal is magnesium?

    A   +182

    B   +40

    C   −40

    D   −182

Emotion Recognition

Some computerised systems have become very good at recognising human emotions by analysing facial expressions and voice patterns.

In a series of tests, a system analysed videos of people speaking when they were angry, sad, happy or showed no emotion (neutral). After each video, the system classified the emotion shown.

In the first test, the system analysed only the voice from the videos. In the second test, it analysed only the face. In a final test, the system analysed the voice and face combined.

The tables show the results of the tests. For example, when videos were shown but only the voice was analysed, the system mistakenly classified 22% of angry people as being happy.

Voice-only analysis

		Classified emotion			
		anger	sadness	happiness	neutral
Actual emotion	anger	68%	5%	22%	5%
	sadness	7%	65%	6%	22%
	happiness	18%	4%	70%	8%
	neutral	4%	14%	1%	81%

Face-only analysis

		Classified emotion			
		anger	sadness	happiness	neutral
Actual emotion	anger	79%	18%	0%	3%
	sadness	6%	81%	0%	13%
	happiness	0%	0%	100%	0%
	neutral	0%	4%	15%	81%

Combined analysis

		Classified emotion			
		anger	sadness	happiness	neutral
Actual emotion	anger	94%	0%	3%	3%
	sadness	0%	79%	3%	18%
	happiness	2%	0%	90%	8%
	neutral	1%	5%	2%	92%

17 For voice-only analysis, which emotion was hardest to classify correctly?

    A   anger

    B   sadness

    C   happiness

    D   neutral

18 Considering just the first two tests, which of the following was most likely?
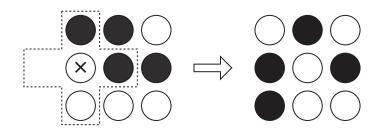
    A   mistaking an angry face for a sad face

    B   mistaking a sad face for an angry face

    C   mistaking an angry voice for a sad voice

    D   mistaking a sad voice for an angry voice

19 How many emotions have a greater chance of being correctly classified by face-only analysis than by combined analysis?

    A   none

    B   one

    C   two

    D   three

NINE DOTS

Antonia places nine identical discs in a 3 × 3 grid. One side of each disc is black and the other side is white.

Antonia selects one disc at a time and turns it over. All neighbouring discs (above, below, left, right) are also turned over.

For example, when the disc indicated by the '✕' is selected and turned over, the three neighbouring discs are also turned over.

20 Selecting which disc changes into ?

A

B

C

D

21 Antonia selects every disc exactly once.

How many times is the centre disc turned over?

- **A** four times
- **B** five times
- **C** eight times
- **D** nine times

22 Antonia starts with
```
○○○
○○○
○○○
```
.

She selects the discs
```
○○○      ○○○      ○○○
○○○      ○○○      ○○○
⊗○○      ○⊗○      ○○⊗
```
and and .

What is the final pattern?

A
```
○○○
○○○
●○●
```

B
```
○○○
●●●
●○●
```

C
```
○○○
○●○
●●●
```

D
```
○○○
●●●
○●○
```

SuperChef

The maps below show information about the number of people in a country who watch the TV show SuperChef.

Map 1 shows the number of people in each state in the country. Map 2 shows the percentage of people in each state who watch SuperChef.

Map 1: Population of each state in the country

Map 2: Percentage of population who watch SuperChef

23 How many **more** people watch SuperChef in State 2 than in State 6?

    A   0.5 million

    B   1 million

    C   1.5 million

    D   2 million

24 How many people in the country watch SuperChef?

    A   5.2 million

    B   7.7 million

    C   52 million

    D   77 million

25 The number of people who **do not** watch SuperChef in State 6 is twice as many as the number who do watch SuperChef in
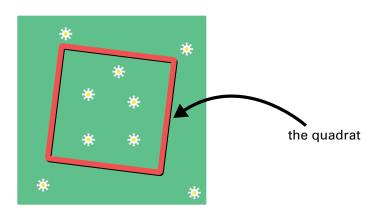
    A   State 3.

    B   State 4.

    C   State 5.
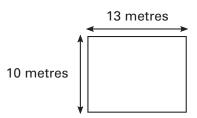
    D   State 6.

QUADRATS

Bobby has a square frame called a *quadrat*. Each side of the quadrat is 1 metre long.

Bobby can use the quadrat to estimate the total number of flowers on her lawn.

First, Bobby throws the quadrat onto the lawn at random. She then multiplies the number of flowers inside the quadrat by the total number of 1 metre × 1 metre squares that could fit on the lawn.

the quadrat

26 This diagram shows the size of Bobby's front lawn.

13 metres

10 metres

When Bobby throws the quadrat onto the lawn, she finds 5 white flowers inside the quadrat.

What is Bobby's estimate of the total number of white flowers on the lawn?
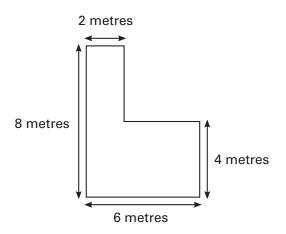
A 115

B 130

C 515

D 650

27 Bobby throws the quadrat onto her back lawn, and counts 6 white flowers inside the quadrat.

She estimates that there are 132 white flowers in total on the lawn.

The lawn is a rectangle.

What could be the size of the lawn?

A 5 metres × 2 metres

B 5 metres × 4 metres

C 11 metres × 2 metres

D 11 metres × 4 metres

28 This diagram shows the size of Bobby's friend's lawn. Bobby throws the quadrat onto the lawn.

2 metres

8 metres

4 metres

6 metres

There are 3 yellow flowers inside the quadrat.

What is Bobby's estimate of the total number of yellow flowers on the lawn?

A 60
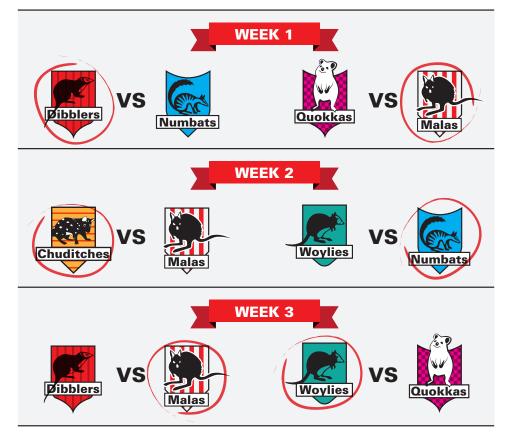
B 96

C 144

D 288

Soccer League

In a soccer competition there are six teams. Only two games are played each week.

Samira has circled the winning teams from the first three weeks of the season.

A team always defeats teams worse than themselves, and always loses against teams better than themselves.

None of the six teams are equally good.

WEEK 1

Dibblers VS Numbats   Quokkas VS Malas

WEEK 2

Chuditches VS Malas   Woylies VS Numbats

WEEK 3

Dibblers VS Malas   Woylies VS Quokkas

---

29 Which one of these results would **not** occur?

    A   Chuditches defeat Dibblers

    B   Numbats defeat Quokkas

    C   Woylies defeat Dibblers

    D   Chuditches defeat Woylies

---

30 A new team, the Boodies, joins the league.

The Boodies defeat the Quokkas and the Numbats.

Which of the other teams are the Boodies sure to defeat?

    A   Woylies   **C**   Dibblers

    B   Chuditches   **D**   no other teams

AI learning

Using artificial intelligence (AI), computers can learn how to recognise objects in photos.

One AI system was designed to determine whether cars were present in photos.

The tables below show the results of three tests.

Test 1

Did the photo show a car?		Did the computer report a car in the photo?	
		yes	no
	yes	44	22
	no	12	42

Test 2

Did the photo show a car?		Did the computer report a car in the photo?	
		yes	no
	yes	44	8
	no	22	46

Test 3

Did the photo show a car?		Did the computer report a car in the photo?	
		yes	no
	yes	88	24
	no	24	104

31 In Test 1, for how many photos was the AI's reporting incorrect?

    A   12

    B   22

    C   34

    D   64

32 In which test was the AI's reporting on photos without cars **least** accurate?

    A   Test 2

    B   Test 3

    C   Test 1 and Test 3 equally

    D   Test 2 and Test 3 equally

Pet prescription

A veterinarian uses a type of pill to treat different animals for an illness.

The table below shows how many pills that different types of animals need per day.

Animal	Number of pills per day
cat	1 + 1.5 per kg
rabbit	0.5 + 0.5 per kg
small dog	2 + 2 per kg
large dog	3 + 2 per kg

For example, each day a cat needs 1 pill, plus 1.5 pills for every kilogram (kg) that it weighs. This means that a 5 kg cat needs:

$$1 + (1.5 \times 5) = 1 + 7.5 = 8.5 \text{ pills per day}$$

33 Rose has a 4 kg cat and a 4 kg small dog that both need treatment.

What is the total number of pills, per day, that Rose needs for her pets?

A 6.5 **C** 17

B 15 **D** 26

34 Yasmin has a 5 kg small dog that needs treatment.

For how many days would a bottle of 60 pills last?

A 4 days

B 5 days

C 6 days

D 7 days

35 Piper has a 6 kg pet that needs 10 pills per day.

What type of pet does Piper have?

A cat

B rabbit

C small dog

D large dog

END OF TEST